

Xiaodi “Ada” Yuan

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EDUCATION

University of California San Diego

September 2023 - Present

Ph.D. in Computer Science

- Advised by Prof. Hao Su

Tsinghua University

September 2019 - June 2023

B.Eng. in Computer Science

- Yao Class, Institute for Interdisciplinary Information Sciences (IIIS)
- GPA: 3.97/4.00, rank 3/32

RESEARCH EXPERIENCE

Real-Time IPC Simulation for Soft-Body Manipulation

Oct 2022 - Present

Mentor: Hao Su, Yin Yang, Tao Du

- Implemented a GPU-accelerated IPC (Incremental Potential Contact) simulator on the GPU. It supports deformable objects using FEM (Finite Element Method) and rigid objects using ABD (Affine Body Dynamics).
- It served as the simulator for the ManiSkill-ViTac Challenge 2024. Thanks to the realistic simulation of the GelSight tactile sensor, the policy trained in the simulated environment can be transferred to real-world robots.

Physical Simulation Projects

Mar 2022 - Aug 2022

Mentor: Hao Su

- **MPM and System Identification:** Implemented a differentiable MPM (Material Point Method) framework with PyTorch. A neural network can be plugged into the framework and optimized using differentiable simulation to estimate the physical properties of objects.
- **SPH and ManiSkill2:** Participated in the ManiSkill2 project, a robotic manipulation benchmark that supports rigid and soft-body tasks. Implemented the SPH (Smoothed-Particle Hydrodynamics) algorithm for the simulation environment of a soft-body manipulation task.

Parametric CAD Scan Completion

Aug 2021 - Feb 2022

Mentor: Li Yi

- Developed a generalizable point cloud completion method for CAD models by deducing the parametric modeling process from the partial observations.

PUBLICATIONS

- Weihang Chen, Jing Xu, Fanbo Xiang, **Xiaodi Yuan**, Hao Su, Rui Chen. “General-Purpose Sim2Real Protocol for Learning Contact-Rich Manipulation With Marker-Based Visuotactile Sensors”. *IEEE Transactions on Robotics (TRO)*, 2024.
- Jiayuan Gu, Fanbo Xiang, Xuanlin Li, Zhan Ling, Xiqiang Liu, Tongzhou Mu, Yihe Tang, Stone Tao, Xinyue Wei, Yunchao Yao, **Xiaodi Yuan**, Pengwei Xie, Zhiao Huang, Rui Chen, Hao Su. “ManiSkill2: A Unified Benchmark for Generalizable Manipulation Skills.” *International Conference on Learning Representations (ICLR)*, 2023.

LANGUAGE SKILLS

- **TOEFL:** 109 (Reading 30, Listening 29, Speaking 24, Writing 26)
- **GRE:** 329 + 4.0 (Verbal 159, Quantitative 170, Writing 4.0)

HONORS AND AWARDS

- **The National Scholarship** 2019 - 2020
- **Outstanding Student Leader** | Institute for Interdisciplinary Information Sciences, THU 2021
- **National Olympiad in Informatics (NOI), Silver Medal** 2018